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International Technology Transfer and Economic Development

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ABSTRACT

This paper intends to critically examine the concept of International Technology Transfer, considering Japan whilst they provide necessary tech advancements ideas for innovation to another transferee country i.e., India. This country realized the high significance of the technology transformation for its fast economic and commercial growth. We will also be analyzing Japan's position as a tech superpower and an economic superpower. To analyze the economic development, a comparative study will be made with India. Here, Japan is the transferor, and India is selected due to its high intentions for development, and hence it needs support from developed nations with better technology. In this study, we take the balance of payment as the dependent variable and GDP, inflation rate, Exchange rate, and FDI as independent variables. Data is analyzed and results are obtained using regression which helps us analyze quantitatively. The data from the World Bank database about India and Japan has been obtained for the periods 2000-2019. This study helps us to interpret and find the key impacting factors of the balance of payment behavior in these nations. The empirical results show that India's GDP, as well as the inflation difference between Japan and India, are found to be very critical. The coefficient of India's GDP and inflation difference was positive while India's exchange rate and India's FDI were found to be negative. As the impact of India's exchange rate and India's FDI was negative, it is proof that an increase in India's exchange rate and India's FDI results in a decrease in the balance of payment, thereby the trade is ultimately affected. These results contain useful information that can be used by policymakers.

Keywords: Balance of Payment, Japan, India, International Technology Transfer, FDI, GDP, Inflation, Exchange rate.

INTRODUCTION

The flow of data from the creator to the secondary user, mainly from the developed countries to the developing country to increase their economies is known as technology transfer. Designs, materials, software, inventions, trade secrets, or technical expertise can be transferred from one company to another or from one country to another. The processes, policies, and values of each country/organization included guiding the process of technology transfer. Productivity, health, income, and lifestyles of individuals and countries are highly influenced by technology. The less developed countries feel that they are far behind the developed countries because of rapid technological advancements and insufficient infrastructure, and the transfer of technology has become a major source of concern for scholars, businesses, and policymakers.

However, due to many obstacles and constraints such as lack of infrastructure and educational growth of people, technology transfer has become a difficult process. One of the main problems overlooked in technology transfer is to acquire a clear procedure to determine the best technology among several other technologies.

Tech transfer and its promotion in the country itself were twinned with the immense growth in Japan's direct overseas investment during the years 1967 to 1973. The direct overseas investment outgrew ever before because the Asian countries showed a positive attitude towards foreign direct investment in accord with them swapping to export-oriented industrialization and Japan's liberalization of capital movements along with rising wage costs in Japan. During the late 1960's Japan was surfacing to be a technology exporting nation largely to the developing countries in Asia. Concurrently, it is broadly accepted that technology transfer is crucial to a country's industrial and economic growth. LDCs are more likely to increase their productivity and efficiency by receiving technical skills and knowledge from affluent countries. By transforming inputs into outputs, effective technology transfer permits these countries to efficiently utilize human & natural resources. Also, it allows to expand their technical abilities by bringing in and acquiring technologies from other countries. The technology transfer appears to be a main strategic element that should be combined with the national development planning of LDCs. The experiences during the last three decades of the East Asian Countries show that these countries can maximize their outcome, upgrade their labor force skills, and speed up the industrialization process through adoption, adaptation, and absorption of imported technologies. The developing countries are satisfied that it is impossible to align the development gap concerning the industrialized nations within the predictable future. According to Jafrieh (2001) Industrial countries are themselves aware of the developing countries' constantly growing significance as markets for their exports and that they should therefore have the technology to self-build competitive export to fund their imports from the developed countries.

Despite the major significance of tech transfer in the growth of less developed countries' industries and technologies, there have been some common issues with successful and effective technology transfer. These complications, which comprises of the receiving country's lack of absorptive capacity and the negligence of the transferor to transfer the real technology and technical expertise resulted in the unsuccessful transfer of technology. Hence, these countries must encourage their domestic technical capabilities to effectively adjust and embrace overseas technologies for their domestic needs. LDCs should also find and solve their technological weaknesses, such as creating proper industry and technology infrastructure. The imported technology must be modified and linked to the current technologies which could take it to a fast industrialization process.

LITERATURE REVIEW

Japan being a technological giant has always attracted the developing countries like India to seek its assistance and help strategic technological cooperation in key areas like Artificial Intelligence, Financial technology, Space, Rare piles of earth as well as in Advanced Materials, Critical Cyberinfrastructure, and developing robust Information and Communications Technology (ICT) products (Australian Institute of International Affairs) in supply chain.

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Due to Japan's international competitiveness in optical undersea cable network, India has worked with Japanese firms to develop the Digital India programme. The Andaman and Nicobar Islands, which are strategically important, were connected to Chennai by the NEC Corporation (Japanese multinational information technology and Electronics Corporation). India is developing a new undersea optical cable project to connect Kochi and the Lakshadweep Islands, and it may enlist Japan's assistance. The cable that runs between Singapore-Myanmar-India, that intends to improve network communications arising from Asia is also involving Japanese corporations. Also, developing smart islands and cities in India utilizing cleaner and energy-efficient technologies is an important priority in the India-Japan partnership due to the possibility to solve concerns about energy safety, the economics, and the ecology. The ability to transition from coal and oil to greener, clean power while possessing the necessary technical knowledge, financial resources, and infrastructure is projected to alter geopolitical balances and resource politics. Tokyo's growth goal includes AI in addition to telecom technologies. Japan's Artificial Intelligence Technology Strategy was formulated by the "Strategic Council for AI Technology", which outlined Research and Development in the field of Artificial Intelligence and the commercialization plan of Japan to create an Artificial Intelligence oriented platform before 2030. The next revolution in productivity will be driven by Artificial intelligence (AI) and robotic sensors. AI and data science are now included in Japan's R&D tax free status, as well as financing for the creation of new AI-powered robots. While major nations are harnessing AI because it has the potential to transform manufacturing, labor markets, trade, and defense, the debate over its impact on geopolitics is equally significant. Countries who invest early in AI innovation will profit not only in terms of competing globally, but also in terms of possessing power geopolitically (Digvijay, Shafighi, 2021). As a result, creating an ecosystem that supports AI start-up R&D while also improving human capital is critical (Chavan, Shafighi, 2021).

International Technology Transfer Policies

MNEs are a major knowledge source and economic growth source around the world, as indicated through the increased concentration on policies targeted at enticing and retaining foreign investment. According to Andrenelli, policies that attempt to provide a proper supportive environment for ITT, policies that may have the effect of imposing ITT to varied degrees, and policies that result in a forced transfer of technology are all part of the continuum of ITT-related measures, Andrenelli, A., Gourdon, J. and Moïsé, E. (2019).

Market failures and externalities associated with technology transfer and dissemination have been deemed substantial enough in numerous cases to necessitate government intervention. Such approaches include specific actions relating to Intellectual Property Rights (IPR), the facilitation of Foreign Direct Investment (FDI) that is related to technology, and policies targeted at increasing absorption capacity. According to the OECD Policy Framework for Investment, promotion and facilitation includes strategies like reducing bureaucratic hurdles, establishing entities to promote investment, establishing data-sharing connections, and improving the ecosystem. Despite efforts to focus investments from abroad towards modern technological industries, these programs target luring abroad firms and expediting the foreign investment method. (Chavan, Shafighi; 2021)

IPR rules may be applied in a way that discriminates against foreign interests to enable the transfer of technology from foreign investors to local enterprises (Maskus, 2000). According to a survey about IPR practices and regimes, the agreeable impact that IPR protection has on ITT

varies depending on the host nation's development level. Liegsalz and Wagner (2013) present an outline of the State Intellectual Property Office's (SIPO) institutional basis in patent examination. Mansfields (1994), offered groundbreaking evidence suggesting technology-intensive enterprises are wary of transferring breakthrough innovations to nations with weak intellectual property regulations (Edrak et al, 2014).

As a result, emerging countries with superior technology may be able to strengthen their intellectual property protection and so increase their attractiveness to potential investors (UNCTAD, 2005).

Japanese investment in India

On a net flow basis, Japan's FDI in India increased to $5,551 million in 2008, followed by $3,664 million in 2009. But, objectively speaking, FDI of Japan in India has lost pace after the two enterprises exited the market, whereas from 550 during 2008 till 1,441 in 2018, the number of enterprises joining the Indian market has continuously increased and is expected to reach more than 6000 in 2022.

According to a study conducted by the Reserve Bank of India, Japan topped the list of countries with which Indian companies engaged in Foreign Technology Collaboration (FTC) in 2012-13 and 2013-14.

The share of agreements involving during the survey period:

1. Royalty and technical fees as whole made-up 30.5 percent,
2. Only royalty stood at 48.1 percent
3. Only lump-sum technical costs accounted for 21.4 percent.

Investments by japanese in india ate poised for a boom

These efforts are reflected in recent deal figures. Between 2015 and 2020, more than 90 Japanese mergers and acquisitions (M&A) agreements were conducted in India, with an average deal value of $45 million and a total value of around $10 billion. (Japanese investments in India are poised for a boom. (2021))

Towards Economic Development

The economic link between Japan and India has gradually grown and developed in recent years. The trade amount between the two nations has grown. In 2010, India was Japan's 18th largest trading partner, and in 2020, Japan will be India's 12th largest trading partner. Also, Japanese direct investment in India has increased, and India's 4th huge investor was Japan in FY2020. The interest of the private sector of Japan in India is growing, and there are currently 1,455 big Japanese organizations with branches in India.

Two leaders reaffirmed their commitment to combine India's demographic dividend with Japan's technology and capital to realize the actual potential of the Japan-India economic partnership for a flourishing future at recent summit discussions. Two leaders applauded the decision to conclude a 75 billion US$ Bilateral Swap contract, the start of the digital partnership between Japan and India, and other cooperation and initiatives.

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Economic Transformation

Since 2002, the overall volume of commerce between Japan and India has increased, reaching around 6.8 billion US dollars in 2005. But this figure does not reflect the economic power and the potential of the two countries. Japan and India's trade share are shrinking, as is their relative importance. Among Japan's export destinations, India ranks 26th among (0.6 percent) and among the import sources, 28th (2.8 percent), with Japan ranking 10th among export destinations (2.5 percent) and 10th among import sources (2.8 percent). The interest of Japan in India is expanding for various reasons, which also includes the country's enormous and developing economy as well as its resources, particularly its human resources. The exports from India to Japan totaled 3.94 billion US dollar, compared to US$ 7.93 billion in imports. The principal exports from India to Japan are petroleum industry products, chemicals, elements, compounds, non-metallic mineral goods, fish & fish preparations, metalliferous ores & scrap, clothing & accessories, iron & steel products, textile yarn, textiles, and machinery. India's key imports from Japan are machinery, electrical machinery, iron and steel commodities, plastic materials, nonferrous metals, automotive components, organic chemicals, metal manufactures, and other items.

Investment and FDI

Between January 2000 and December 2017, Japanese investments in India totaled $27 billion, accounting for 7.3 percent of the country's total FDI inflows. Telecommunications received 12 percent of FDI equity inflows from 2000 to 2016, 26 percent from the Drugs and Pharmaceuticals sector, 22 percent from the Service sector, 19 percent from the Automobile sector, and 13 percent from the Metallurgical sector. India was identified as the second most desirable investment location by Japanese companies in a poll conducted by the Japan Bank for International Cooperation (JBIC) in FY2017.

Trade Relationship

Goods trade is a vital component of any economic partnership between two countries. Japan is one of the world's main trading potentials, but India's unilateral trade liberalization has progressively expanded the Indian economy's trade intensity. Despite this, commerce between the two nations has remained stagnant.

In general, international conventions have guided both economies' trade, and both the nations are committed to strengthen rules-based multilateral trading systems. India and Japan have also pledged to cooperate in the development of an East Asian community, and they collaborated at the East Asia Summit to promote regional economic integration in Asia.

The quantity and the kind of Japanese FDI into India explains at least some of the above-mentioned bilateral trade stagnation, both in terms of quantity and composition. Unlike Japan's investments in China, South Korea, Thailand, and Singapore, it appears that Japan's investments in India have been predominantly focused on servicing the Indian domestic market.

METHODOLOGY

In this study, we used secondary data to gather from the year 2000 to 2019 to utilize independent variables on determining economic progress. The world bank provides secondary data for this publication. The overall length of time is 19 years. The sample size is based on data from the previous 19 years. (Without eliminating any data.). The Method used for examination

is regression analysis. As a result of technology transfer, there are numerous elements that play a critical role in determining a country's economic success. The relationship between the exchange rate and other independent variables including inflation, foreign direct investment, gross domestic product, exchange rate, and BOP is investigated. And this information will be compared between Japan and India. The balance of payment is chosen as dependent variable for the reason to identify the total trade between Japan and India with respect to the independent variables such as FDI, Inflation rate, GDP, and Exchange rate. Hence, by calculating the trade value (imports/exports), the international technology transfer is identified.

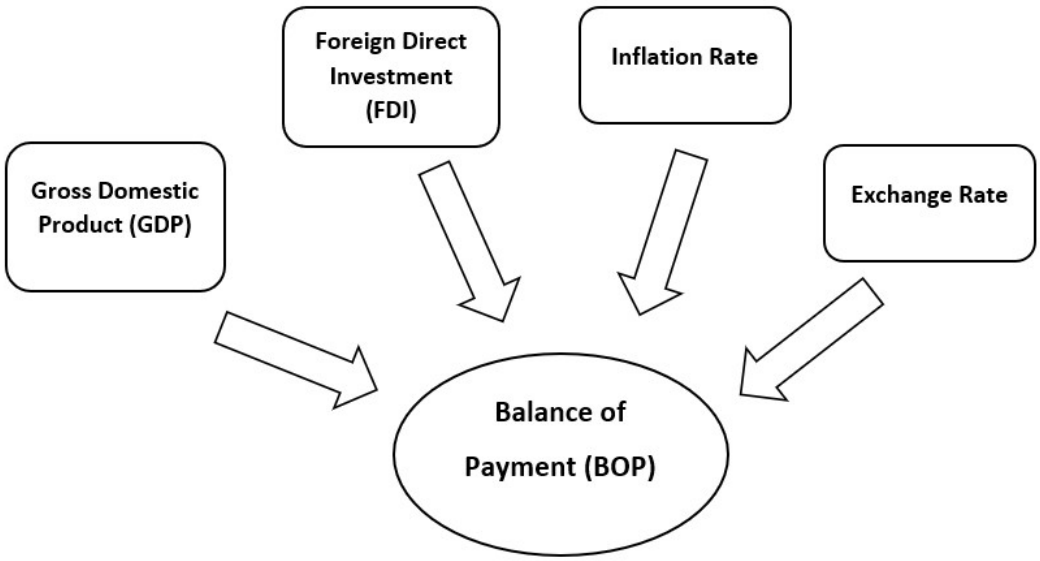

Figure 1. Research Framework (Author)

Balance of Payment

BOP, which stands for Balance of Payment, helps to keep track of financial transactions involving people, organizations, and governments. The statement of a nation describes if the nation has excess funds or under deficit. For example, if there are more exports than imports, then BOP will be in surplus. On the other hand, the vice versa would mean there is a deficit. The importance of BOP of a country could be explained with these justifications:

- A country's BOP explains its economic situation
- It also describes the appreciation or depreciation of the national currency
- The BOP statement helps the government to make crucial decisions regarding budgeting and trade policies
- It provides crucial data for analyzing and comprehending a country's financial connections with different nations

Balance of payment mainly has three components which are current account, capital account and finance account. The sum of the capital and finance accounts should be equal to the sum in the current account. Tracking of receipts and transactions made for production of materials as well as the tracking of commodity and service trade between nations are enabled by the current account. Furthermore, it also contains transactions that are made internationally across countries. Finally, the cash flow between nations through land, entrepreneurship and FDI are all accounted in the financial account. Moreover, the home assets owned by foreign entities as

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well as assets in a different country owned by domestic entities are accounted for here (Digvijay, Shafighi 2021).

The activities engaged in production, income generation and distribution, consumption, and accumulation in the general economy are all influenced by the balance of payments flows. Credit and debit entries in balance of payments accounts for commodities and services, for example, are equivalent to product and service export and import flows. These flows are recorded in the economy's goods and services account, which has an influence on GDP measurement and final demand component composition (e.g., final consumption, gross capital formation, etc.).

Inflation Rate

Inflation refers to the rate at which prices rise over time. Inflation is defined as a wide measure of price fluctuations or increases in the cost of living in a country. Inflation is a measurement of how much something costs.

Higher inflation is inevitable in nations that are undergoing intensive financial growth. As aggregate demand (AD) increases higher than the aggregate supply, the inflation rate is expected to become even higher. Whereas there is also a case where supply is outpaced by demand which is an indicator that the economic growth is not sustainable in the long term as it is too quick (Moosavi, and Gharleghi, 2021).

Inflation could hamper economic growth mainly due to the following reasons:

- Inflation causes relative price distortions in economies that have not fully adjusted to a certain rate of inflation. Real interest rates become negative and erratic when nominal interest rates are managed, discouraging savings. Exchange rate depreciation falls behind inflation, resulting in real appreciation and exchange rate volatility (Gharleghi and Shaari, 2012; Gharleghi and Shafighi, 2015).
- Real tax revenues do not keep pace with inflation since they are based on nominal incomes from the previous year (the Tanzi effect), and public utility expenses do not rise in lockstep with inflation. Inflation exacerbates the fiscal problem for both reasons, and public savings may be reduced. This could have a negative impact on public investment.
- Inflationary pressures are unsettling. Inflation rates are unclear in the future, which diminishes investment efficiency and discourages potential investors.

Gross Domestic Product

- GDP is defined as the total financial or commercial value of all completed services that are produced inside a nation's boundaries in a specific time frame. As it is a wide metric for all home manufacturing, it acts as a complete evaluation for an overall health of the economy.
- GDP is a metric for estimating the scale and growth rate of the economy of a nation.
- Expenditures, output, and income are the three methods for calculating GDP. It may be modified for inflation and population to offer more details.

GDP may be calculated in three different ways. All three techniques should return the same result if they are computed correctly.

Exchange Rate

The value of a currency (the local currency) in relation to a different one is referred to as the exchange rate (foreign currency). Another explanation for exchange rate could be said as the rate at which a country's currency can be exchanged for another countries. Exchange rate has a crucial role in global financial transactions. Moreover, oscillations in these rates have impacted other vitals like interest and inflation rates, trade, and output, among others. The relevance of the exchange rate arises from the fact that it links two different nations' price regimes, allowing international trade to simply compare exchanged products.

A strong exchange rate can depress economic growth because:

- Exports are becoming costly, which causes a reduction in export demand.
- Imports are less expensive, hence imported goods are in more demand (which leads to reduced demand for home grown goods).
- This consequently decreases Aggregate Demand (AD)
- In addition, the country maintained having high interest rates to sustain the strength of its currency. Such interest rates, on the other hand, slowed financial development.

A currency devaluation (a decrease in the purchasing power of money) may frequently help to boost wealth creation. Lowering the currency rate decreases the exporting cost while also increasing demand for British goods. This can help to improve economic expansion by increasing demand.

Such a devaluation leads to inflation:

- Import of goods get costlier
- Demand for home-grown products increase

Foreign Direct Investment

One of the most important channels for technology transfer is foreign direct investment (FDI). FDI incorporates all flows from the investor, whether directly or through affiliates, in national income calculations. It also contains equity capital, as well as reinvested earnings, and net borrowings. There is a substantial amount of common literature on the benefits and drawbacks of FDI for the nations that are developing. Out of these, the most significant benefit of FDI is that it introduces new information, technological expertise, economic, and business abilities. The major motives for a company to get involved in global investment are to gain ownership of businesses in different nations and to utilize the company's advantages abroad. For many developing countries, the relevance of FDI as a technology transfer channel has been critical. Except in South Korea, where FDI is a key technological resource in certain areas like chemicals, electronics, and refining petroleum, this is especially true for East Asian countries (Fransman M., & King, K., 2021). Japan’s MNCs turned into the world's most significant moves of worldwide capital and the world's most significant wellspring of innovation. Japanese MNCs in general pack their interest in North American and the European Countries, that represented the greater part of Japan's absolute venture surge in assembling during the period 1950-1990 (Kaosa-ard, M. S., 2017).

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DATA ANALYSIS

The following table shows that data of trade between Japan and India from the year 2000 to 2019 (Trend Economy data)

Table 1: Trade between Japan and India from the year 2000 to 2019

Trade between Japan-India (US$ Million)			
Years	**Exports**	**Imports**	**BOP**
2000	2,277	2,415.70	-138.21
2001	1,987	2,289.04	-302.45
2002	1,870	2,094.69	-224.36
2003	2,391	2,179.43	211.73
2004	3,044	2,613.96	429.72
2005	3,518	3,192.18	325.72
2006	4,453	4,054.99	397.97
2007	6,156	4,173.68	1,982.22
2008	7,895	5,256.08	2,639.42
2009	6,338	3,728.11	2,610.35
2010	9,042	5,698.04	3,344.16
2011	11,078	6,822.96	4,254.89
2012	10,591	7,000.14	3,590.40
2013	8,593	7,072.38	1,520.65
2014	8,130	6,987.50	1,142.73
2015	8,110	4,865.17	3,244.69
2016	8,189	4,674.42	3,514.34
2017	8,851	5,356.43	3,494.42
2018	11,011	5,497.60	5,513.47
2019	10,978	5,364.65	5,613.70

The corresponding table shows the log values of the corresponding data for dependent and independent variables.

Table 2: Log values of the corresponding data for dependent and independent variables. (Author)

Dependent Variable	**Independent Variables**			
BOP (Japan – India)	**GDP - India**	**Inflation Difference**	**Exchange Rate – India**	**FDI - India**
2.218115186	1.17E+01	0.670803941	1.652648578	9.554394333
0.001300933	1.17E+01	0.655075553	1.673816976	9.70995594
1.89814466	1.17E+01	0.71772475	1.686728473	9.716751615
2.711962032	1.18E+01	0.608783842	1.668230104	9.566081976
2.865202929	1.19E+01	0.577010171	1.656256041	9.734739919
2.79876735	1.19E+01	0.65603079	1.644438343	9.861498998
2.845977831	1.20E+01	0.744070912	1.656165386	10.30166185
3.359012712	1.21E+01	0.800224913	1.616460109	10.40187836
3.468770402	1.21E+01	0.843182192	1.638541003	10.63755254
3.464460083	1.21E+01	1.087610706	1.684892617	10.5512227
3.562008967	1.22E+01	1.104124001	1.660161427	10.43770119
3.658807048	1.23E+01	0.960280206	1.669042144	10.56227686

3.590379646	1.23E+01	0.971479245	1.727843965	10.38013315
3.261049515	1.23E+01	1.02371339	1.767881648	10.44952516
3.160221437	1.23E+01	0.555244485	1.78554337	10.53878283
3.55000025	1.23E+01	0.706112309	1.8072102	10.64354636
3.581812031	1.24E+01	0.703952475	1.827336958	10.6479555
3.579539882	1.24E+01	0.306140821	1.81372773	10.60169168
3.764693237	1.24E+01	0.588920791	1.834986253	10.62446208
3.772112487	1.25E+01	0.856289001	1.847696021	10.70424189

RESULTS-ANALYSIS

Now, the result of relation, and the reliability to determine the Balance of Payment with the help of Regression Analysis.

In this research,
BOP = India GDP, Inflation difference, India Exchange Rate, India FDI

Regression Analysis

To evaluate what this information explains in finalizing the Balance of Payment with the help of independent variables such as India GDP, Inflation Difference, India Exchange Rate, and India FDI.

Table 3: Regression Statistics (Author)

Regression Statistics	
Multiple R	0.860401561
R Square	0.740290847
Adjusted R Square	0.671035073
Standard Error	0.506814655
Observations	20

The independent variables' classification towards the dependent variable is done by Regression. In the table above, Multiple R is the correlation and R square tells how properly the model fits our data. If the r square value is 0 to1, then the model is perfect.

From the above table, R square value is 0.7402 (74.02%). This means that 74.02% of the data collected explains the relation between the dependent and independent variables. Also, it is seen that the data collected is precise and yields good results to explain the reliability in determining the Balance of Payment.

Anova table

The below ANOVA table analysis is performed to explain if this model is efficient. All the variables taken in the above analysis can be included as the ANOVA result in the **Table 4** proves that there is significant difference between the mean of the variables.

Table 4: ANOVA test (Author)

ANOVA					
	df	*SS*	*MS*	*F*	*Significance F*
Regression	4	10.9825885	2.745647125	10.68922924	0.000266097
Residual	15	3.85291642	0.256861095		
Total	19	14.83550492			

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From the above ANOVA table (Author), Significance value F is smaller than alpha, i.e., α = 0.05, hence this model really fits well for the analysis. Also, it indicates overall, the significance of the overall predicted regression model to study the balance of payment. As the P Value is smaller than 0.05 (P<0.05), this calculation helps in increasing the confidence level for the regression analysis projected for the given data set is satisfactory, acceptable, and valid. The R square value is the ratio of Explained error (due to regression) divided by the total amount (ANOVA table).

The below table is the regression analysis result (Author) and indicates the overall result of the coefficient produced from multiple regression analysis. The coefficient result will be used and explained.

Table 5: Regression Analysis Result (Author)

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-40.82934054	9.255569766	-4.411326539	0.000505318	-60.55712051	-21.10156057	-60.55712051	-21.10156057
GDP - INDIA	5.201117455	1.632118553	3.186727731	0.006128106	1.722339106	8.679895804	1.722339106	8.679895804
INFLATION DIFFERENCE	0.020028613	0.700619879	0.028586989	0.977570868	-1.47330731	1.513364536	-1.47330731	1.513364536
EXCHANGE RATE - INDIA	-6.426750767	2.835222165	-2.266753853	0.038623411	-12.46988376	-0.383617772	-12.46988376	-0.383617772
FDI - INDIA	-0.786767772	0.859098696	-0.915806037	0.374257385	-2.617893297	1.044357753	-2.617893297	1.044357753

From the coefficient value from the above table, it is straightforward to assess the correlation between independent variable and Dependent variable. It is observed that coefficients of independent variables India GDP and inflation difference are positive whereas coefficient of India exchange rate and India FDI are negative.

That means if India GDP and inflation difference increase, the Balance of Payment (BOP) also increases. Hence, from these findings, it can be observed that independent variables like India GDP and inflation difference are directly proportional to Balance of Payment and indirectly proportional to India Exchange Rate and India FDI. As independent variables India Exchange Rate and India FDI decreases, then the dependent variable Balance of Payment increases or vice-versa.

Inference

Hypothesis analysis done from regression analysis, it is found that p-values of independent variables India GDP and India exchange rate are less than alpha (α = 0.05) whereas p-values of independent variables Inflation difference and India FDI are more than alpha (α = 0.05). It can conclude that hypothesis of independent variables India GDP and India exchange rate are accepted whereas hypothesis of independent variables inflation difference and India FDI are rejected. Hence, it explains that there is correct correlation between the independent variable India GDP and India exchange rate as compared to other independent variables like inflation difference and India FDI for determining the Balance of Payment.

CONCLUSION AND DISCUSSION

In conclusion, the Comprehensive Economic Partnership Agreement (CEPA) between India and Japan has to be finalized as soon as possible so that both bilateral trade and investment may reach their full potential, given the two countries' respective economic sizes. Compared to other major economies, trade and investment values are similarly low. Japan's trade and investment flows to India account for barely 3% of Japan's total trade and investment flows to China. Despite India's potential as an investment destination, as emphasized in a JBIC survey done in

2008, the flow of investment from Japan in recent years has been insufficient. Japan's infrastructure technologies and investment can assist India's infrastructure industry bridge the supply gap. Furthermore, Japan's IT hardware may enhance India's software strengths, while India's strengths in pharmaceutical, biotechnology, and auto components can complement Japan's expertise in heavy engineering, vehicles, equipment, and chemical manufacturing. The Indian government is implementing reform and liberalization measures in recognition of the importance of attracting FDI in the nation. India is one among the top 10 FDI-attracting host economies, according to the United Nations Conference on Trade and Development's (UNCTAD) 2018 World Investment Report. As of 2017, Japan is India's fifth largest FDI investor, accounting for 4% of the country's FDI inflows. Overall, enhanced commercial and political ties benefit both India and Japan significantly. The trade with Japan has never been stronger than it has been in recent years when Japanese investors have poured money into various industries and Indian imports have been boosted. The weak infrastructure, taxation system, and administrative issues are inhibiting Japanese investment in India. However, as a result of the easing of constraints as a result of several bilateral agreements between the two nations, Japan began investing directly in infrastructure. Despite not being a member of the RCEP, India's new diplomatic strategy, known as the "look-east" policy, has resulted in improved commercial relations. India's infrastructure development is aided by improved economic relations with Japan. The trade imbalance between India and Japan is concerning, and certain actions must be implemented to close the gap. Changes in policy should be made to identify areas where India's commodities might be exported to Japanese markets. Japan's investments, on the other hand, boost the (Indian) economy by offering superior resources. On a variety of fronts, it is clearly clear that Japan and India are not just dealing with physical things but are also leveraging an underlying history of cultural interactions for the mutual benefit of their citizens. While India and Japan develop their respective economies and begin to have an influence on international trade, the two nations may not hesitate to expand their collaboration and partnership in a variety of areas. To increase Japanese investment in India, India has to communicate information on investment possibilities, establish new areas of partnership and cooperation, reduce administrative hurdles, and eliminate delays.

Finally, technology upgrading in a growing economy is determined by the level of acceptance and assimilation of foreign technologies, which is impacted by local product market circumstances, determinants (such as skilled labor), and government policies and institutions (such as trade and competition policies, and regulatory framework). Many developing nations are struggling to create a clear, comprehensive, and effective policy environment that encourages investment in skills and technology, as well as the institutional capacity to implement such policies. They must also adopt strong macroeconomic policies that promote long-term high growth, price stability, and stable external accounts. A stable and effective policy environment not only encourages skill development and innovation, but also better prepares the country to profit from increased FDI and trade. The further study can be made by analyzing on the legislative policies of Japan, for a similar adoption by the Indian parliament.

The major aim of this research was to analyze the technology transfer from Japan to India by measuring the dependent variable balance of payment using the independent variables Inflation rate, exchange rate, FDI, and GDP. All the data was obtained from the World Bank database. The results revealed that India GDP and inflation differences between Japan and India are found to be very significant in determining the balance of payment. The coefficient of India

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GDP and inflation difference were positive while India exchange rate and India FDI found to be negative. As the impact of India exchange rate and India FDI was negative, it is a proof that an increase in India exchange rate and India FDI results in a decrease in the balance of payment, thereby the trade is ultimately affected. More specifically, when the India exchange rate and India FDI increases, the difference in all the money flowing into Japan in a specific time period and the money outflow to India is affected. However, since India GDP and inflation difference are positive, overall, both India and Japan are benefiting heavily from the strengthened trade and diplomatic ties. Since the R square value is 74.02%, 74.02% of variation in the balance of payment can be predicted from the variations in the India GDP, inflation difference.

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